ABSTRACT

THESIS: Studies Involving Potential Chemical Attractants from *Rudbeckia hirta* Inflorescences

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Our research involves the isolation and identification of the possible chemical compounds in black-eyed Susans that may be responsible for the olfactory attraction of the crab spider *Misumenoides formosipes* to the inflorescences of these plants.

In olfactometric bioassays, 80% of 30 male spiders moved towards olfactory-only cues from *R. hirta* inflorescences over a water control (P = 0.0014). The bulk extract was separated using flash column chromatography (silica column) with a series of solvents. Spiders in olfactometer bioassays showed a significant preference for the fractions collected using 100% dichloromethane over the solvent-only control (P=0.039).

The 100% dichloromethane pooled fractions were separated using solid phase extraction (SPE). Three compounds were isolated and identified using TLC, infrared and NMR spectroscopy. Two compounds were identified as contaminants, di(2-ethylhexyl) phthalate and erucamide, found in the flash column chromatography apparatus and SPE

apparatus, respectively. A long-chain crystalline hydrocarbon wax was extracted from *R. hirta* inflorescences. Research shows that several insects use the lipids of the wax layer, specifically various long-chain alkanes and alcohols, as cues in host plant selection or as kairomones, chemical cues used in communication from one organism to another [3]. It also shows that the waxes can act as absorbents or release agents for biologically active material. Thus, the long-chain hydrocarbon wax interacting with the volatile components could play a major role in attracting the male crab spiders to the *R. hirta* inflorescences.